9. SCHEDULE

INTRODUCTION

Scheduling is an important aspect of a successful monitoring program. Scheduling in the GRYN is used to balance short- and long-term planning requirements with timely implementation, data analysis and reporting. Once the vital signs monitoring program is fully operational, a schedule of monitoring frequencies will enable the network to develop staffing plans and annual budgets. Currently, the network is focused on planning, and this chapter describes the design and implementation schedule for vital signs monitoring, along with three major activities that will take place over the next ten years.

TABLE 9.1 Schedule of field testing and implementation of monitoring protocols in the GRYN. Protocols for streamflow, climate and land use will, at a minimum, cover data handling and reporting procedures using existing data sources. The symbol ✕ indicates the year implementation of field testing phase (pilot) took place; the symbol ★ indicates the year implementation of the monitoring protocol is expected.

Protocol name	Schedule			
	2005	2006	2007	2008
Climate		★	★	★
Streamflow		★	★	★
Land use		★	★	★
Integrated water quality		★	★	★
Regulatory water quality	★	★	★	★
Invasive plants			★	★
Whitebark pine	✕	★	★	★
Amphibians	✕	★	★	★
Aridland soil structure and stability		★	★	★
Aridland seeps and springs	✕	★	★	★
Landbirds	✕	★	★	★

PROTOCOL SCHEDULE

Sample Design and Sample Protocols

Vital sign protocol development requires sufficient time and resources to ensure scientific reliability, while also meeting the information needs of the GRYN. Planning requires a commitment of staff time and, for this reason, the GRYN will implement a schedule for developing sampling design and protocols, conducting field trials and soliciting peer review and approval. This schedule is most critical during the first years of the program when substantial investment of staff time is necessary to see that the protocols are complete and ready for implementation.

The GRYN is scheduled to complete 12 monitoring protocols following the approach discussed in Chapters 4 and 5 of this report. Table 9.1 shows the planned implementation schedule for monitoring protocols under development and, where there is more than one vital sign treated in a protocol, illustrates the relationship between vital signs and protocols. For each protocol in the table, a Protocol Development Summary is available in Appendix VI. The overall schedule for developing the three-phase Vital Signs Monitoring Plan (described in Chapter 1) is established by WASO, while the protocol implementation schedule is established by the network.

Field Testing

For most vital signs, full implementation will be preceded by field testing, which will cover selected pieces of the whole protocol. An exception to field testing may be made for protocols that are well established and for which substantial refinement is not anticipated. In the GRYN, all monitoring protocols, except for climate and land use, will undergo at least one year of field testing. Monitoring protocols will undergo revision following field testing and prior to peer review and approval.

Peer Review and Approval

The schedule for submitting finished protocols to the Intermountain Regional Office for peer review and approval allows for the incorporation of field testing results, as well as peer review comments, before implementation begins (usually in the spring/summer of the same year).

MONITORING SCHEDULE

The transition from planning to monitoring signals an important milestone in the vital signs monitoring program (Figure 9.1). Implementation includes all aspects of monitoring operations such as data collection, data management, analysis and reporting. For the GRYN program, monitoring officially starts in 2005 with the implementation of the regulatory water quality protocol. Monitoring will incrementally increase as monitoring protocols are completed and approved for implementation by the Intermountain Regional Office.

OTHER IMPORTANT PLANNING NEEDS

Park-Sponsored Monitoring Protocols

In addition to planning and implementation of the network's 12 vital signs, the GRYN will need access to monitoring information collected by park-sponsored monitoring programs. Existing natural resource monitoring programs at the network parks present a challenging integration opportunity for the GRYN. Since many of the park-sponsored monitoring programs provide essential data and information necessary in a long-term monitoring program, it is critical that the network provide resources to see that monitoring protocols in use across the network are adequately documented and include a strategy for data stewardship and reporting.

As network monitoring protocols are approved and implemented, planning will shift towards helping update and/or revise existing park monitoring protocols. Over the next ten years, the network will provide technical assistance and support to park-sponsored monitoring programs for these activities. The overarching goal is to move towards an integrated approach to acquiring and interpreting vital signs monitoring data. The technical expertise of network staff can help to standardize procedures and establish quality control, data management and reporting protocols. This step will help promote coordination and communication of monitoring activities at the park and regional levels and will promote broad participation in monitoring and use of resulting data.

Vital Sign Selection
2003
> GRYN Board of Directors approves network vital signs (August 2003).
> Phase II Monitoring Plan submitted to the IMR and WASO.

Monitoring Plans and Protocols
2004
> Protocols (step by step procedures) started and draft monitoring objectives compiled.
> Phase II Water Quality Monitoring Plan submitted to the IMR and WASO.
> Vital Signs Monitoring Plan: Phase III submitted to the IMR and WASO for administrative review (December 15, 2004).

Implementation Year 1
2005
> Vital Signs Monitoring Plan updated and approved (September 30, 2005).
> Regulatory water quality monitoring protocol complete and peer reviewed.
> Implementation of the regulatory water quality protocol begins; pilot implementation takes place for whitebark pine, amphibians and landbirds.
> NPSPecies database initial certification complete.
> First annual report to the park superintendents.

Implementation Year 2
2006
> Finish and implement monitoring protocols according to schedule.
> Second annual report to the park superintendents.

Implementation Year 3
2007
> Finish and implement monitoring protocols according to schedule.
> Third annual report to the park superintendents.

Implementation Year 4
2008
> First GRYN vital signs (I&M) program review.

FIGURE 9.1 Schedule of major milestones in the Vital Signs Monitoring Program.

User Requirements Analysis and System Design

Integration with the network parks and other ongoing monitoring programs will produce an enormous amount of data; however, for these data to be helpful they must be processed and converted into timely information products that are usable and accessible e.g. when the network prepares a synthesis report on the health and integrity of park ecosystems. For the network to effectively use monitoring data for reporting and other purposes, one must first determine the data's relevance to monitoring goals and objectives; data that are certified as valid, complete and fully documented with FGDC spatial and biological metadata can be processed to meet the requirements of the end-user. A user requirements analysis is a highly recommended starting point for data acquisition and design, especially in the complex data management environment facing the network.

A user requirements analysis is a process by which the stakeholders, in this case the park natural resource managers, scientists, technology specialists, GRYN and regional and/or WASO staff work together to specify user information needs so that a thorough understanding of these needs is understood before database system design begins. At a conceptual level, a user requirements analysis will ensure that the natural resource data and information systems developed by the network are designed to fulfill the network as well as the park business needs.

An examination of user requirements is scheduled for aquatic and terrestrial ecosystems over the next 24 months. The outcome of this exercise will be a purpose, scope and schedule for data and metadata development based on identified needs of the network vital signs monitoring program and also the needs of the network parks. Since data management is a cornerstone of each monitoring protocol, the user requirements analysis can also help the network prioritize and schedule updates and/or revisions to existing park-sponsored monitoring protocols described earlier in this chapter.

Program Review

As discussed in Chapter 5, a full program review is scheduled in 2008 to evaluate how well sample designs of individual protocols are achieving the monitoring objectives, and whether the overall program represents the best compromise between the information needs of the parks and the corresponding costs. This overall review will compliment the individual protocol reviews and focus on the full suite of our monitoring program toward achieving the overall program goals.